Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20056

In the Matter of	)	
	)	
Amendment of the Commission's Rules Regarding Multiple Address Systems	)	WT Docket No. 97-81
	)	

REPLY COMMENTS OF MOTOROLA

Motorola hereby submits these comments in response to the record developed in the above captioned proceeding.[1] Motorola urges the FCC to ensure that it fully accommodates the needs of private users and wireless telecommunications common carriers as it modifies its rules for Multiple Address Systems ("MAS"). Motorola also recommends certain technical modifications for MAS.

Background: On February 16, 1997, the FCC adopted a Notice of Proposed Rule Making seeking to examine ways that maximize use of spectrum allocated to multiple address systems in the Fixed Microwave Services.[2] MAS channels are commonly used on a two-way fixed basis by "power, petroleum, and security industries to satisfy various alarm, control, interrogation, and status reporting requirements".[3] MAS channels are also used on a one-way

[1] Motorola manufactures two-way data radios for use on multiple address frequencies and thus has an interest in this proceeding. Motorola is also a leading manufacturer of base station infrastructure for paging and advanced messaging services which are commonly controlled by radio links operating on multiple address frequencies.

[2] *In the Matter of Amendment of the Commission's Rules Regarding Multiple Address Systems*, WT Docket No. 97-81, FCC 97-58, released February 27, 1997, (hereinafter *Notice*).

[3] *Notice* at ¶4.

basis by paging operators and other providers of wireless communications service to control multiple transmitters operating in the same geographic area.

MAS frequencies for private uses have been allocated from the 928 MHz, 952 MHz, and 956 MHz bands whereas other frequencies in the 928 MHz band and the 959 MHz band were made available primarily for common carrier control links. More recently, forty 12.5 kHz channel pairs in the 932-932.5/941-941.5 MHz (932/941 MHz) band have been allocated for shared use by all government and non-government users. Although approximately 50,000 applications were submitted for this unoccupied band in 1992, the FCC has not yet completed its processing of these applications nor has it issued any licenses.

The subject *Notice* is intended to facilitate the further development and implementation of MAS by streamlining licensing procedures and increasing licensee operational and technical flexibility. In very broad scope, the FCC's *Notice*:

- Proposes to designate MAS spectrum for either "subscriber-based" services or "private" use. Subscriber-based channels would be licensed on a geographic area basis using competitive bidding procedures. Comment is sought on whether the licensing procedures for private use channels should be modified.
- Proposes to increase operational and technical flexibility by allowing mobile operations on MAS channels. Comments are sought on whether 12.5 kHz MAS channels can be aggregated to form wider bandwidths.
- Proposes to return the pending 50,000 applications for the 932/941 MHz band and use competitive bidding procedures to issue licenses. Five channel pairs would be reserved for public safety and federal government use.

Comments filed in response to the *Notice* presented a wide range of views on the these proposals. Private MAS users expressed concern that their needs were not adequately accounted for in the FCC's tentative decision to designate the 932/941 MHz band for

subscriber-based services (except for the five channel pairs reserved for public safety and Federal Government use). Common carrier interests expressed concern about the impact on their existing use of MAS frequencies for control link purposes. These commenters questioned whether the interference protection rules for incumbents were adequate and questioned whether MAS channels principally used for control link purposes should be designated as subscriber-based and auctioned. Finally, pending applicants for the 932/941 MHz band expressed great displeasure at the FCC's tentative conclusion to return those applications and to restart the licensing process for that band.

Comments of Motorola: In general, Motorola supports the FCC's efforts to review the MAS services to ensure that the allocations are being efficiently used and that the licensing procedures coincide with the needs of the affected industries. In so doing, however, the FCC must ensure that its actions do not needlessly upset the operations of incumbent users. To this end, Motorola supports the FCC's tentative decision to designate the former Part 94 MAS channels in the 928/952/956 MHz bands as private use frequencies. For decades, these channels have been used by the nation's critical industries for SCADA[4] operations and other point-to-multipoint operations. As noted by the Commission, more than 70 percent of the licenses issued in this band have been assigned for private use.[5] Clearly, their continued designation as private is appropriate.

[4] Supervisory Control And Data Acquisition.

[5] *Notice* at ¶12.

Motorola also agrees with the comments of private user associations such as UTC, Affiliated American Railroads, and the American Petroleum Institute (API), which argue that site-by-site licensing more accurately meets the needs of private users and is a more exact way of encouraging more efficient use of the spectrum by private industry.[6] Attempting to match the diverse and varied service area requirements of private users into the rigid confines of the Economic Areas developed by the Department of Commerce would likely result in users getting licensed for more area than they need. Since private users do not have the incentive to expand operational service area in search of new customers, geographical licensing would likely result in inefficient spectrum use.[7] Also, geographic licensing likely would prove unwieldy for users that develop long "ribbon-like" MAS systems along railroads and utility pipelines who would be required to obtain licenses over multiple contiguous geographic areas.

Motorola also supports the comments of the private MAS users that argue that some portion of the now fallow 932/941 MHz band be set aside for private MAS use in addition to those 5 channel pairs already proposed for public safety users. According to the FCC's *Notice*, approximately 7700 licenses have been granted for use of the 1.7 MHz of spectrum principally used by private users. This is heavy loading of the spectrum and indicates that additional channels are needed to ease congestion. Further, both UTC and API provide evidence that, in many locations, users are having to forego necessary communications due to

[6] Comments of UTC at 26, Comments of Affiliated American Railroads at 3, Comments of API at 30.

[7] Motorola recognizes that some private users such as utilities often do have wide area requirements. The FCC should adopt flexible licensing policies so that such users can license their service areas in a non-burdensome manner. *See* Comments of UTC at 27.

the lack of MAS channels. Motorola therefore urges the FCC to review this evidence and expand the number of channels designated as private use to both relieve existing congestion and to promote future expansion.[8] Given that the comments did not demonstrate strong interest in these channels for subscriber-based services increasing the allotment for private use would be appropriate.

Motorola supports the FCC's tentative decision to expand operational flexibility by allowing mobile services on MAS channels. While Motorola generally opposes unbridled flexibility in the allocation process, we believe that there are examples of ***complementary*** mobile services that will coexist well with traditional fixed MAS. For example, utilities have designed mobile meter reading systems using MAS channels where a monitoring truck drives through a neighborhood reading meters from the street. While permitted today under strict regulation, providing greater flexibility in the allocation will likely lead to the development of enhanced features for this type of application. In Motorola's view, this and other types of advanced messaging and data systems would be complementary to the existing point-to-multipoint fixed services currently being conducted on the MAS channels; particularly on those channels that will be licensed for geographic areas. Motorola therefore supports adding a Mobile Service designation to the allocation tables for MAS frequency bands.

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[8] In the same vein, Motorola urges the FCC to review the comments of Airtouch Paging and Arch Communications Group who argue that "intermediate" control links should not be subject to auction. Comments of Airtouch Paging and Arch Communications Group at 4. These commenters note that this issue was previously considered by the FCC as recently as 1993 when it had rejected an earlier proposal to subject intermediate links to the newly authorized competitive bidding procedures. Motorola agrees with these commenters that no new evidence has been documented that would support revising this earlier decision.

Turning to technical issues, Motorola notes that the existing Part 101 rules for MAS systems limit base station transmit power to 200 Watts ERP. For wide area services licensed on a geographic basis, this level may prove too restrictive. Other wireless services authorized over wide service areas such PCS, paging and SMR are permitted greater latitude for base stations not located near the boundary of the defined service area. For example, the 900 MHz SMR service licensed over major trading areas are limited to a 40 dBu field strength at the edge of the service border but, otherwise, are permitted facilities up to 1000 watts at 1000 feet above average terrain.[9] Like the MAS, the 900 MHz SMR service is based on 12.5 kHz channels and is located in the same general location of the spectrum. Motorola therefore recommends that the FCC modify the maximum permitted power for wide area MAS licenses based on the precedent offered by the 900 MHz service. Doing so would provide MAS licensees with a technical parity with other wireless services.

Also, the emissions limits for 12.5 kHz MAS channels are similar to the limits for the 900 MHz SMR service[10] with one notable exception. The required attenuation for MAS systems at displacement frequencies between 9.5 kHz and 15 kHz from the carrier must conform to the formula 157 $\log_{10}$ (f_d/5.3) decibels.[11] The emission mask for the 12.5 kHz channels in the 900 MHz SMR service provides additional flexibility and allows emissions at the same displacement frequencies (between 9.5 kHz and 15 kHz) to be attenuated ***the lessor***

[9] See Section 90.635 of the FCC's Rules.

[10] See Section 90.210(j) of the Commission's Rules.

[11] Where f_d is the displacement frequency in kilohertz. See Section 101.111(a)(5)(iii) of the Commission's Rules.

of 157 $\log_{10}$ (f_d/5.3) decibels or 50 + 10 log(P) decibels (where P is the unmodulated carrier power of the transmitter) or 70 decibels. The ability to attenuate emissions based on the transmitter output power resolves an attenuation anomaly for low power transmitters. In the case of a one watt transmitter, simply requiring emissions to be attenuated by the 157 $\log_{10}$ (f_d/5.3) decibels schedule would require 70 dB attenuation at 15 kHz. Immediately beyond 15 kHz, the required attenuation would be 50 dB based on the mask described in Part 101. This disjointed level of attenuation is unnecessary for low power mobile or portable devices.

To accommodate the needs of low power transmitting devices on two-way MAS channels, Motorola urges the FCC to modify Section 101.111(a)(5)(iii) to read as follows (additions in bold):

> On any frequency removed from the center of the authorized bandwidth by a displacement frequency(f_d in kHz) of more than 9.5 kHz up to and including 15 kHz: at least 157 $\log_{10}$ (f_d/5.3) decibels, **or 50 + 10 log(P) or 70 dB whichever is the lesser attenuation;**

This would remove any penalty associated with low power devices and render the MAS rules consistent with the 900 MHz SMR service.

In conclusion, Motorola urges the FCC to resolve these issues quickly so that additional MAS channels can be made available as soon as possible. The need for additional MAS spectrum by the utility, petroleum and paging industries is acute.

Respectfully Submitted,

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